

Family Pteraclidae

Body ovate elliptical, elongated, greatly compressed. Head moderate or large, compressed, not greatly elevated, upper profile rounded, not partly vertical. Snout short. Eye large, prominent, center usually little in advance of middle of head. Mouth large. Maxillary extends below eye. Teeth small, uniform, in jaws, on palate and tongue. Nostrils usually well separated. Interorbital elevated. Gill rakers few, lanceolate. Scales moderate or rather large, firm, hard, more or less lobate. Row of enlarged basal scales along dorsal and anal. Ventral

719

with axillary scale. Dorsal and anal fins very greatly extended, continuous, all rays simple, none articulated or branched, very slender, close set, nearly hair like. Anal begins far forward, before pectoral.

Ventral jugular, inserted before pectoral or about under eye, with spine and 3 to 5 rays.

Fishes mostly of small size, and known from few specimens which mostly immature. They are remarkable for the greatly elevated dorsal and anal. All are pelagic.

Analysis of Genera

a.' Dorsal begins on snout before eye, with 2 to 8 graduated anterior spines. Pteracanthus.

a.? Dorsal begins on head above hind eye edge or behind eye, with 9 to 13 graduated anterior spines. Pterycombus.

721

Genus Pteraclis Grunow

Pteraclis Grunow, Act. Helvética, vol. 7,
p. 44, 1772. (Species nonbinomial. Type
Coryphaena velifera Pallas, designated
by Jordan and Gibert, Bull. U. S.

Pterocles Agassiz, nomencl. Zool.,
Index Univ., p. 314, 1846. (Type
Coryphaena velifera Pallas.)
(Emendation.)

↓ → Pterillum Scopoli, Introd. Hist.
Nat., p. 454, 1777. (Type Coryphaena
velifera Pallas, monotypic.)

Oligopodus Lacépède, Hist. Nat.
Poiss., vol. 2, pp. 511, 518, 1800. (Type
Coryphaena velifera Pallas, monotypic.)
(Oligopodus Cuvier, 1817, not involved.)

Pteroclides Agassiz, nomencl.
Zool., Index Univ., p. 314, 1846.
(Type Coryphaena velifera
Pallas.) Emendation.)

Genus Pteracis Gronow

Pteracis Gronow, Act. Helvética, vol. 7,
p. 44, 1772. (Species nonbinomial. Type
Coryphaena velifera Pallas, designated
by Jordan and Gibert, Bull. U. S.
Nat. Mus., no. 16, p. 455, 1882.)

Ulfiformes Pteracles Swainson, Nat. Hist.
of animals, vol. 2, p. 257, 1839. (Type
line. Pteracis ocellatus Valenciennes,
seratonotypic.) (Error.)

→ Pterillum Scopoli, Introd. Hist.
Nat., p. 454, 1777. (Type Coryphaena
velifera Pallas, monotypic.)

Oligopodus Lacépède, Hist. Nat.
Poiss., vol. 2, pp. 511, 518, 1800. (Type
Coryphaena velifera Pallas, monotypic.)
(Oligopodus Cuvier 1817, not involved.)

Pteraclidus Rafinesque, Analyse de
la nature, p. 82, 1815. (Type
Coryphaena velifera Pallas, virtually,
of head. Pteraclidus Rafinesque proposed
to replace Pteracis Gronow.)

1971, 1972.

Coryphaena

by Jordan

et. Mus., h.

Teeth in jaws slender; villiform on palate or tongue. Nostrils double. Opercle without spine. Pteractis usually entire, sometimes heterodontotypic

→ Pterillium

Nat., p. 454,

velifera Pall

Oligopodium

Pöiss, vol. 2,

Coryphaena

~~Oligopodus~~ ^{two}

Pteractidius

supplemental bone, not slip below very narrow preorbital, a nature, p.
surface silvery like rest of head Coryphaena
Pteractidius
slit between base of mandible replace Pier
preorbital to permit its base →

Bentenia Jordan and Snyder,
Journ. College Sci. Univ. Tokyo,
vol. 15, p. 306, 1901. (Type
Bentenia aesticola Jordan and
Snyder, monotypic.)

emphasized as several blackish blotches opposite first and second dorsals and front of caudal peduncle. Iris yellowish to brown. Barbels sulphur yellow. Fins all pale brownish with several obscure darker bands on front of spinous dorsal and soft dorsal, as 5 obliquely over upper caudal lobe and as many over lower, though latter only on inner or posterior half of lobe. Other fins uniformly whitish.

East Indies, Philippines Closely related to Upeneus tragula, though with paler lower fins and different coloration.

Body oblong, greatly compressed, deep anteriorly, tapering regularly and slenderly behind. Head large, compressed. Snout short. Eye large. Mouth nearly vertical. Maxillary broad. Teeth small, slender, in 1 or 2 series in jaws, often absent from palate and tongue. Gill rakers few. Pseudobranchiae present. Air bladder small. Abdominal cavity extends well behind vent. Pyloric appendages 6. Scales rather large, firm, each with median horizontal furrow or emargination, these forming distinct striated lines along rows of scales. Sheath of very large scales along entire bases of dorsal and anal fins. Long axillary ventral scale.

724

Scales on head and breast small. Dorsal fin begins on snout, with 2 to 8 graduated spines, one thickened or not; long rays like those of anal, nearly reaching caudal.

Analysis of Species

- a': Dorsal spines 41 to 46, anal 35 to 42.
- b': Dorsal spines 41, anal 35; dorsal and anal deep violet blue with short gold and green iridescent stripes between rays. papilio.
- b'': Dorsal spines 45 or 46, anal 42; dorsal with blue apical blotch size of eye. ocellatus.
- a'': Dorsal spines 50 to 55, anal 40 to 50.
- c': Dorsal spines 50, anal 44; fins without markings. trichopterus.
- c'': Dorsal spines 52, anal 44; fins uniform. carolinus.
- c''': Dorsal spines 55.
- d': Anal spines 50; vertical fins brown, with white spots. velifer.
- d'': Anal spines 40; vertical fins blackish. aesticola.

726

Pteracis papilio Lowe

Pteracis papilio Lowe, Proc.

Zool. Soc. London, vol. II, p. 83,
1843 (type locality, Madeira). —

Günther, Cat. Fish. Brit. Mus.,
vol. 2, p. 410, 1860 (Madeira). —

{ Goode and Bean, Oceanic Ichth.,
p. 212, 1895 (reference).

— Lütken, Kow. Danske Vidensk.
Selsk. Skrift. Kjöbenhavn, vol.
12, no. 6, p. 502, 1880 (reference).

~~Guichenot, Notes Ile Réunion, vol.~~
~~2, 1862, p. 24. — Jouan, mém. Soc.~~
~~Imp. Sci. nat., Cherbourg, séries 2,~~
~~vol. 3, 1868, p. 253 (Hong Kong); séries~~
~~2, vol. 5, 1870, p. 106 (Seychelles). — Bleeker,~~
~~Verhandel. Kon. Akad. Wetensch.~~
~~Amsterdam, vol. 15, no. 3, 1875, p. 6 (Java,~~
~~Bawean, Bali, Madura, Sumatra, Nias,~~
~~Singapore, Celebes, Sangir, Sumbawa,~~
~~Timor, Halmahera, Batjan, Obi major,~~
~~Amboina, Saparua, Philippines); Atlas~~
~~Ichth. Ind. Néerland., vol. 2, 1877, pl. (2)~~
~~392, fig. 3. — Klunzinger, Fische Roth.~~
~~meer., 1884, p. 49. — Madagascar, Poiss., 1891, p. 219 (not pl.~~
~~27, fig. 2) (Red Sea, Mauritius,~~
~~Pondicherry, Batjan, Celebes, Amboina,~~
~~Borabora, New Guinea, Tahiti).~~
~~Steindachner, Sitz. Ber. Akad. Wiss.~~
~~Wien, math.-naturwiss. Klasse, vol. 115,~~

Depth somewhat less than 4.

D. XXVI, VI; A. XXXV; ventral 6.
Fourth dorsal spine and second
anal spine stronger than others.
Head and body silvery white.
First dorsal and anal deep
violet blue, with short gold and
green iridescent stripes between
rays.
(Günther.)

Eastern Atlantic.

Pteracis ocellatus Valenciennes

Pteracis ocellatus Valenciennes,

Hist. Nat. Poiss., vol. 9, p. 363, ~~1832~~

~~pl. 27t~~, 1833 (type locality,

Mozambique); Règne Animal,

Cuvier, éd. ill., Poiss., pl. 66, fig.

2, 1839. — Günther, Cat. Fish.

Brit. Mus., vol. 2, p. 411, 1860

(reference). — Goode and Bean,

Oceanic Ichth., p. 212, 1895 (reference).

— Guichenot, Notes Ile Réunion, vol. 2,
p. 26, 1862. — Sauvage, Hist. Nat. Madagascar,
Poiss., p. 518, 1891 (reference).

— Jordan, Ann. Carnegie Mus.,
vol. 12, p. 332, pl. 58 (copied), 1919.

— Barnard, Ann. South African
Mus., vol. 21, pt. 2, p. 597, Oct. 1927
(compiled).

Cuv¹⁷⁹ Upeneus vittatus (Forskål)

Mullus vittatus Forskål, Descript.

Animal., 1775, pp. 31. Djedda, Red Sea. + Bonnaterre, Tabl. Ichth., 1788, p. 144 (Red Sea). + Gmelin, Syst. Nat. Linn., vol. 1, 1789, p. 1341 (Red Sea). + Schneider, Syst. Ichth. Bloch, 1801, p. 79 (Red Sea). + Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pl. 382, fig. 1, pl. 14, fig. 1 (Arabia). + Shaw, General Zoology, vol. 4, 1803, p. 616, pl. 89. — Playfair, Fishes of Zanzibar, 1866, p. 40 (Aden, Zanzibar, Mayotta). + Upeneus vittatus Cuvier, Hist. Nat. Poiss., vol. 3, 1829, p. 448 (Pondicherry, Society and Sunda Islands, Mukuhira, Japan). + Rüppell, Nuee Wirbelth. Fische, 1835, p. 101 (near Djedda). + Thiébaut, Fauna Woodlark, 1857, p. 152 (Woodlark Island).

+ Jouan, Mém. Imp. Soc. Sci. Nat.

Cherbourg, vol. 8, 1861, p. 295 (Canala and Port de France, New Caledonia). +

729

Pteraclis ocellatus Valenciennes,
Hist. Nat. Poiss., vol. 9, pl. 271, 1833.
(Error.)

Pteracles ocellatus Swainson, Nat.
Hist. Animals, vol. 2, p. 258, 1839
(reference).

12825. Cavite and San Roque markets.

June 27, 1908. Length 75 mm.

12830. Cavite and San Roque markets.

June 27, 1908. Length 101 mm. Type,
no. 68402 U. S. N. M.

5972. Cavite market. December 1, 1908.
Length 82 mm.

20556 and 20557. Subic market,
Tiliq. July 14, 1908. Length 67 to 71 mm.

1 example. Subic Bay. January 7, 1908.
Length 58 mm.

depth 3; head $3\frac{1}{2}$. Snout $5\frac{7}{8}$
 in head from snout tip; eye $3\frac{1}{2}$,
 much greater than snout;
 maxillary reaches $\frac{3}{4}$ in eye,
 expansion 2 in eye, length $2\frac{1}{4}$
 in head from snout tip;
 supraorbital height nearly equals
 vertical eye diameter.

Scales 50 to 52 in lateral
 series, 17 transversely. Lateral
 line axial.

D. XIV or XV, begins over
 middle of snout, first spine
 nearly long as eye, second $1\frac{1}{2}$ in
 head, third $1\frac{3}{4}$ in fish without
 caudal; A. XII, first spine
 nearly equals combined snout and
 eye with base little before hind
 preopercle edge, fourth spine
 $1\frac{2}{5}$ in fish without caudal; least
 depth of caudal peduncle $5\frac{1}{3}$ in
 total head; caudal $1\frac{9}{10}$; pectoral

$1\frac{1}{8}$, rays 15; ventral rays 4,
fin $1\frac{2}{3}$ in total head.

Body silvery, dorsal and
anal blue gray. Near apex of
dorsal spot or ocellus of clear
blue about size of eye. Dorsal
and anal fins blue gray. Caudal
and pectoral yellowish. Length
59 mm. (Valenciennes.)

Mozambique Channel.

? Pteraclis trichopterus Valenciennes (732)
Hist. Nat. Poiss., vol. 9, p. 367, 1833
(no type locality). — Griffith,
Animal Kingd. Cuvier, vol. 10, p.
, pl. 32, fig. 2, 1834.

Pteraclis trichopterus Guichenot,
Notes Ile Réunion, vol. 2, p. 26, 1862;
Mém. Soc. Sci. Nat. Cherbourg,
ser. 2, vol. 2, p. 146, 1866 (Madagascar).
— Lütken, Kon. Danske Vidensk. Selsk.
Skrift. Kjöbenhavn, vol. 12,
no. 6, p. 502, 1880 (reference).

Pteraclis trichopterus Sauvage, Hist.
Nat. Madagascar, Poiss., p. 518,
1891 (error) (reference).

Mullus bandi Shaw, General Zoology,
 vol. 4, pt. 2, 1803, p. 615 (on Bandi
gooolivinda Russell, Fishes of Coromandel,
 vol. 2, 1803, p. 43, pl. 158, Vizagapatam).
Upeneus bitaeniatus Bennett, Proc.
 Comm. Zool. Soc. London, May 1831, p.
 59. Mauritius.

Lota summumilar (Montagu)
Thiollière, Fauna Woodlarks, 1857, p. 152
 (name in synonymy).
Upeneoides philippinus Fowler, Proc.
 Acad. Nat. Sci. Philadelphia, 1918, p. 37,
 fig. 15. Philippines; 1927, p. 285 (Crown;
 types).

733

Depth $3\frac{3}{5}$; head 4. Snout 6 in head from snout tip; eye $2\frac{1}{2}$, greatly exceeds snout, also greater than supraorbital depth; maxillary reaches $\frac{2}{5}$ in eye, nearly vertical, length $1\frac{2}{3}$ in head from snout tip.

Scales small on body, also cover most of head. Lateral line axial, complete.

D. ~~5~~⁵₀, fin begins over front eye edge with first 3 spines graduated to third which $1\frac{1}{2}$ in head, fin height equals fish without caudal; A. ~~X~~^V_{IV}, fin height $1\frac{2}{3}$; other fins subequal with head.

Body silvery, less brilliant on fins. Length 88 mm.

(Valenciennes.)

Madagascar.

Pteracis carolinus Valenciennes

Pteracis carolinus Valenciennes,
Hist. Nat. Poiss., vol. 9, p. 368, 1833
 (type locality, Carolina, Collection Boe).
 — Günther, Cat. Fish. Brit. Mus.,
 vol. 2, ~~1860~~ p. 411, 1860
 (compiled) — Jordan and Gilbert,
Bull. U. S. Nat. Mus., no. 16, p. 455,
 1882 (copied). — Goode and Bean,
Oceanic Ichth., p. 212, ~~pl. viii fig.~~
~~1888~~ 1895 (not figure; reference).
 — Jordan and Evermann, Bull. U. S.
 Nat. Mus., no. 47, pt. 1, p. 956, 1896
 (compiled).
 — Lütken, Kon. Danske Vidensk. Selsk.
 Skrift. Kjöbenhavn, vol. 12, no. 6, p.
 502, 1880 (reference).

Mus., vol. 71, 1927, p. 7 (Bengkoelen,
Sumatra). — ~~Fowler, Journ. Bombay
Nat. Hist. Soc., vol. 32, no. 2, Oct. 20, 1927,
p. 259 (Bombay); Mem. Bishop Mus.,
vol. 10, 1928, p. 226 (Tahiti; Nukuhiva,
Suva, Apia, Strong Island, Ebm Island,
Society Islands).~~ ^m ~~Fowler~~, Proc. Acad. Nat. Sci.
Philadelphia, 1929 (1930), p. 610
(Hong Kong), p. 647 (Tahiti; types of
Upeneoides philippinus).

Upeneoides vittatus ~~Klunzinger~~, Verhand.
zool. botan. Gesellsch. Wien, vol. 20, 1870,
p. 741 (Red Sea). (Error) ^m ~~Molpus~~, Ceylon
Administrat. Rep., 1921, pp. E5, E6.
[Herre and Montalban, Philippine Journ. Sci.,
vol. 36, no. 1, May 1928, p. 105, pl. 4, fig. 1
(Aparri, Bangui, ^{Lt Union}, ~~Boac~~, ~~Calbayog~~, Alaminos,
Iba, Orani, Pasay, Manila, Nasugbu, ^{Minoro}, ~~Tatlayoc~~,
~~Kawagisan~~, Borongan, ~~Washington~~, Capiz,
Bantayan, Iloilo, Cebu, Bohol, Dumanque, Agusap River, Cagayan de Misamis, Balabac,
Davao, Zamboanga, Cotabato; Sandakan; Guam). ^m

735

Mouth very cleft. Scales rather large. D. I.II, fourth ray somewhat enlarged, other rays slender, those of caudal larger. A. X.IV. Pyloric appendages 6. Uniform silvery, with bluish reflections. Length 100 mm.
(Valenciennes.)

South Carolina.

Pteraclis veleifer (Pallas)

Coryphaena veleifera (Pallas), Spicilegium,
 vol. 8, p. 19, pl. 3, fig. 1, 1770 (type
 locality, "Oceano utriusque Indiae,
 praefertim Orientalis"). — Bonnaterre,
Tabl. Ichth., p. 60, pl. 34, fig. 128,
 1788 (sea of the Indies). — Gmelin,
Syst. Nat. Linnaeus, pt. 1, p. 1193,
 1789 (copied). — Walbaum, Artedi
Pisc., vol. 3, p. 103, 1792 (copied).
 — Forster, Fauna Indica, p. 14,
 1795.

Veleif

Pteridium veleferum Walbaum,
Artedi Pisc., vol. 3, p. 677, 1792 (on
Scopoli).

Pteraclis veleifra Schneider, Syst.
Ichth. Block, p. 143, pl. 35, 1801 ("in
 India orientali").

pt. 1, 1906, p. 1385 (Upolu). $\frac{1}{m}$ Seale,
Oceas. Papers Bishop Mus., vol. 4, no. 1,
1906, p. 51 (Tahiti; Hukuhiva). $\frac{1}{m}$
Jordan and Seale, Bull. Bur. Fisher.,
vol. 25, 1905 (1906), p. 273 (Samoa). $\frac{1}{m}$
Smith and Seale, Proc. Biol. Soc.

Washington, vol. 19, June 4, 1906, p. 78
(Cotabato, Mindanao). $\frac{1}{m}$ Seale and
Bean, Proc. U. S. Nat. Mus., vol. 33, 1907,
p. 245 (Gamboanga). $\frac{1}{m}$ Kendall and
Goldsborough, Mem. Mus. Comp. Zool.,
vol. 26, 1911, p. 292 (Suva, Fiji). $\frac{1}{m}$

Barnard, Ann. South African Mus., vol.
21, pt. 2, 1927, p. 584, pl. 24, fig. 1
(Chatal coast and Delagoa Bay in 40
fathoms).

Hypheneus vittatus Cantor, Journ. Asiatic
Soc. Bengal, vol. 18, pt. 2, 1849, p. 1017
(Pinang).

Pteracanthus velifer Günther, Cat. Fish.

Brit. Mus., vol. 2, p. 411, 1860

(compiled). — Lütken, Kav. Danske Vidensk. Selsk. Skrift, Kjöbenhavn, vol. 12, no. 6, p. 502, pl. 4, fig. 3, 1880
(Atlantic in lat. 23° - 24° N.) (young).

— Goode and Bean, Oceanic Ichth., p. 212, 1895 (reference).

Whitley, Rec. Austral. Mus., vol. 18, no. 4, p. 146,
June 29, 1931 (compiled). — Ogilby, Rec. Austral. Mus., vol. 2, p. 65, Sep. 1893 (New Zealand). — Jordan, Ann. Carnegie Mus., vol. 12,
no. 332, pl. 55 (copied), 1919.

Pteracanthus veliferus Barnard, Ann. South African Mus., vol. 21, pt. 2, p. 598,
Oct. 1927 (St. Helena Bay). — Phillips, Journ. Pan Pacific Res. Inst., vol. 2, p. 73, 1927
(New Zealand).

Oligopodus veliferus Sacépide, Hist. Nat. Poiss., vol. 2, pp. 511, 512,
1800 ("mer des Indes").

Upeneoides vittatus Günther, Cat.

Fishes Brit. Mus., vol. 1, 1859, p. 397

(Philippines, Ceylon, Amboyna, India).

$\frac{1}{m}$ Day, Fishes of Malabar, 1865, p. 27. ✓

Fishes of India, pt. 1, 1875, p. 120, pl.

30, fig. 2. $\frac{1}{m}$ Martens, Preuss. Exped. Ost
Asien, 1876, p. 387 (Amboina). $\frac{1}{m}$ Macleay,

Proc. Linn. Soc. New South Wales, vol. 5,
1881, p. 402 (Endeavour River, Queensland).

$\frac{1}{m}$ Károli, Termesz. Füzetek, Budapest,
vol. 5, 1881, p. 156 (Singapore). $\frac{1}{m}$ Meyer,
An. Soc. Espan. Hist. Nat. Madrid, vol.
14, 1885, p. 15 (North Celebes; ^{Kordo},
Mysore, India).

$\frac{1}{m}$ Day, Fauna British India, Fishes,
vol. 2, 1889, p. 25, fig. 10. $\frac{1}{m}$ Sauvage, Hist.
Nat. Madagascar, Poiss., 1891, p. 219 (not
pl. 27, fig. 2) Mauritius, Pondicherry, Batjan,
Celebes, Amboina, Borabora, New Guinea,
Tahiti). $\frac{1}{m}$ Eleria, Cat. Fauna Filipinas,
vol. 1, 1895, p. 479 (Luzon, Manila Bay,

Pteracis guttatus Valenciennes,
Hist. Nat. Poiss., vol. 9, p. 370, 1833
(on Pallas).

Pteracis pinnata Gray, Cat. Fish
Gronow, p. 170, 1854 (type locality,
"Oceano Indico").

Pteracis (Bentenia) sp. Whitley,
Rec. Austral. Mus., vol. 18, no. 4, p. 146,
June 29, 1931 (New Zealand).

Batangas, ~~Kawagbu~~). $\frac{1}{m}$ Jordan and
 and Evermann, Proc. U. S. Nat. Mus., vol.
 25, 1902, p. 335 (Keerun, Formosa). $\frac{1}{m}$
~~+ Gilchrist and Thompson, Ann. South
 African Mus., vol. 6, 1908-11, p. 163
 Durban).~~ $\frac{1}{m}$ Jordan and Richardson,
 Mem. Carnegie Mus., vol. 4, no. 4, Aug. 28,
 1909, p. 193 (Keerun record). $\frac{1}{m}$ Seale,
 Philippine Journ. Sci., vol. 5, no. 4, 1910,
 p. 278 (Sandakan, Borneo). $\frac{1}{m}$ Zugmayer,
 Abhandl. Kon. Bayer. Akad. Wiss.,
 Math.-physik. Klasse, vol. 26, band 6,
 1913, p. 11 (Mehran). $\frac{1}{m}$ Gilchrist and
Thompson, Ann. Durban Mus., vol. 1, pt.
 4, 1917, p. 365 (references). $\frac{1}{m}$ ~~Fowler~~,
 Proc. Acad. Nat. Sci. Philadelphia, 1925,
 p. 246 (Delagoa Bay). $\frac{1}{m}$ Jordan and
Hubbs, Mem. Carnegie Mus., vol. 10, no. 2,
 June 27, 1925, p. 245 (Kagoshima Bay).
 $\frac{1}{m}$ Fowler and Bean, Proc. U. S. Nat.

B9

depth (without fin sheaths) $4\frac{1}{2}$; head 5. Eye 4 in head, little larger than snout; maxillary reaches below hind pupil edge; teeth uniserial in jaws, 4 or 5 in single row on each palatine, 2 in longitudinal line on vomer. Lower gill rakers 6, wide spaced, spinules on inner edges, smaller one just above bend.

Scales in lateral series 50, transversely 16 or 17 (without fin sheaths). Scales behind pectoral arch each with hooked, backwardly directed spine. Head, except snout and lower jaw, scaly.

D. IV, begins space from premaxillary symphysis equal to $\frac{1}{3}$ eye diameter, first spine very short, then spines longer to fourth which equals eye; A. I.

Traces of silver on body,

dorsal and anal fins blackish.
Length 520 mm. (Barnard.)

Indian Ocean. Bonnaterre's figure shows the orbit equal to the supraorbital height, dorsal fin height $2\frac{1}{8}$ in fish without caudal, anal fin height $1\frac{3}{4}$, and pectoral and caudal each long as head. Both dorsal and anal are dark with innumerable small, irregular pale or whitish spots.

741

Pteraclis aesticola Jordan and Snyder

Bentenia aesticola Jordan and Snyder,
Journ. College Sci. Univ. Tokyo, vol.
15, pt. 2, p. 306, May 20, 1908 (type
locality, Kashima, near Mito,
Hitachi). — Jordan, Tanaka, Snyder,
Journ. College Sci. Tokyo, vol. 38,
p. 133, 1933 (reference).

— Jordan, Ann. Carnegie Mus., vol. 12,
nos. 2-4, p. 333, pl. 56, Dec. 15, 1919
(restored figure).

1327

12152. Manila market. March 12, 1908.

Length 135 mm.

19729. Tacloban market. July 25, 1909.

Length 100 mm.

742

Depth $3\frac{3}{4}$; head 5. Snout $3\frac{1}{4}$
in head; eye $3\frac{7}{8}$, $1\frac{1}{8}$ in snout;
1 in supraorbital height; maxillary
reaches $\frac{2}{5}$ in eye, length $2\frac{1}{8}$ in
head; teeth in narrow bands, fine,
sharp, equal, similar on vomer
and palatines; nostrils well
separated. Gill rakers 1+6,
slender, small, far apart.

Scales 49 in median lateral
series, 12? transversely. Scales
hard, firm, longitudinally striate,
with oblique, angular, posterior
edges; on lower parts of body
each with vertically compressed
median spine. Scales along
dorsal and anal bases enlarged,
papery, form deep sheathed groove
for back fin which may be
completely concealed. Lateral
line ill defined streak.

L.I.T., origin at end of snout,

743

first ray very short and graduated
to fourth, fifth enlarged and
thick, fin height $\frac{1}{5}$ in fish
without caudal; A. XI, origin
opposite hind eye edge, fin
height $\frac{1}{3}$; caudal $\frac{1}{4}$ in head;
least depth of caudal peduncle
 $5\frac{1}{5}$; pectoral $1\frac{1}{8}$ times head,
rays shown as 15; ventral
minute; jugular, 5 in eye,
rays probably 6?

metallic, lustrous silvery.
Fins all black. Length 458 mm.

(Jordan and Snyder.)

Japan.

Genus Pterycombus Fries

Pterycombus Fries, Kon. Svensk.
Vet. Akad. Handl. Stockholm,
(1837 p. 14, (Type Pterycombus
brama Fries, monotypic.)

Centropholis Hilgendorf, Sitz.
Ber. Naturf. Freund. Berlin,
p. 1, 1878. (Type Centropholis
petersi Hilgendorf, monotypic.)

membranes. Scales with 5 basal radiating ~~striae~~; 74 to 92 slender apical denticles, with 5 to 10 transverse series of basal elements; circuli very fine.

D. VII - I, 8, $\frac{1}{2}$, first spine 1 to $1\frac{1}{5}$ in head, first ray $1\frac{3}{5}$ to $1\frac{3}{4}$; A. I, 6, $\frac{1}{2}$, first branched ray $1\frac{3}{4}$ to $1\frac{7}{8}$; caudal 1, deeply forked, lobes pointed; least depth of caudal peduncle $2\frac{1}{5}$ to $2\frac{2}{5}$; pectoral $1\frac{1}{3}$ to $1\frac{2}{5}$; ventral $1\frac{1}{4}$ to $1\frac{1}{3}$.

Back and head above olive brown, sides lighter olivaceous and under surfaces whitish. All upper surfaces more or less obscurely mottled or clouded with darker to dusky. Obscure dark lateral axial band from eye to caudal base medially, crossing above lateral line at beginning of caudal peduncle. In young dark band

Body deeply ovoid, greatly compressed. Head moderate. Snout short, rather obtuse.

Eye very large, nearly half of head. Mouth large, lower jaw well protruded. Maxillary reaches well below eye. Teeth fine, pointed, curve inward in partly regular and irregular rows in jaws, none on palate. Preopercle denticulate in young, entire with age.

Branchiostegals 7. Scales cycloid, moderate. Row of 50 to 53 high basal scales along dorsal and 40 along anal base, forming deep sheaths in which scaleless fins depressible. Dorsal begins at occiput, fin ^{high in young} much longer than body. Anal begins

behind pectoral origin.
Ventral thoracic, with spine
and 5 rays.

Analysis of Species

a.¹ *Centropholis*. Dorsal and anal spines greatly elevated, nearly half length of fish without caudal; dorsal spines 44 to 51, anal 39 to 41.

b.¹ Head $2\frac{7}{8}$; eye $3\frac{1}{8}$ in head; dorsal spines 44, begins over hind eye edge, anal 39. *goodii*.

b.² Head $4\frac{1}{8} 4\frac{1}{4}$; eye 3 in head.

c.¹ Dorsal spines 50, begins over last fourth of eye. *petersii*.

c.² Dorsal spines 49, begins over hind eye edge. *falcatus*.

b.³ Head 5; eye $2\frac{1}{2}$ in head; dorsal begins over hind eye edge; anal spines 41. *ledanoisei*.

a.² *Oterus combus*. Dorsal and anal spines lower, $2\frac{1}{2}$ to 3 in fish without caudal; dorsal spines 42 to 44, anal 37 to 40. *brama*.

Pterycombus
Pteracanthus gooderi (Jordan)

748

Centropholis
Pteracanthus gooderi Jordan, Ann.
Carnegie Mus., vol. 12, nos. 2-4,
p. 332 (342), pl. 58, lower figure
(copied), Dec. 15, 1919 (on Goode
and Bean). — Jordan, Evermann,
Clark, Rep. U. S. Comm. Fisher.,
pt. 2, p. 266, 1930 (reference).

5 examples. Bisit, Mindanao. August 1, 1909. Length 15 to 35 mm.

1 example. San Miguel Harbor, Ticao Island. April 7, 1908. Length 29 mm.

1 example. San Pascual, Burias Island. March 8, 1909. Length 27 mm.

1 example. Santa Cruz Islands, Marinduque. April 24, 1908. Length 36 mm.

1 example. Tiliq, Lubang. July 14, 1908. Length 36 mm.

D. 5595. Zamboanga. October 7, 1909. Length 13 to 14 mm.

[2083.] Powati Harbor, Makyan Island. November 28, 1909. Length 45 mm.

Pteraclis carolinus (not Valenciennes)

Goode and Bean, Oceanic Ichth.,
p. 212, fol. 59, fig. 218, 1895 (Lat. $28^{\circ} 40' 00''$ N., long. $78^{\circ} 46' 00''$, in 504 fathoms).

— Jordan and Evermann, Bull. U. S.
Nat. Mus., No. 47, pt. 1, p. 956, 1896
(above specimen).

1 example. Tomaha Island. December
11, 1909. Length 16 mm.

50639 U.S.N.M. Honolulu, Hawaiian
Islands. Bureau of Fisheries.

Length 37 mm. Type of Apogonichthys
waikiki.

51734 U.S.N.M. Apia, Samoa.
Bureau of Fisheries.

Length 30 mm. Type of Ha vauilae.

51735 U.S.N.M. Apia, Samoa.
Bureau of Fisheries.

Length 32 mm. Type of Tou fo.

depth $2\frac{1}{3}$; head $2\frac{7}{8}$, width $1\frac{2}{5}$. Snout $4\frac{1}{4}$ in head from snout tip; eye $3\frac{1}{8}$, greater than snout or interorbital; maxillary reaches $\frac{2}{5}$ in eye, expansion $2\frac{2}{5}$ in eye, length $1\frac{4}{5}$ in head from snout tip; teeth curved, conic, biserial, outer row little larger, especially below; no teeth on palate or on tongue; interorbital 4, low, little convex. Gill rakers 0 + 7, lanceolate, equal gill filaments, which 2 in eye.

Scales 48 + 6 in median lateral series, 15 series transversely behind gill opening, 6 series transversely at caudal peduncle. Head largely finely scaled, though upper surfaces of snout and interorbital

757

naked. Broad scaly sheath,
one scale deep of large scales,
along bases of dorsal and
anal. Each scale of longitudinal
body series with short
spine, forming horizontal
rows of spines.

D. ~~47~~^{XIV}, tenth ray highest or
 $1\frac{4}{5}$ in fish without caudal;
A. ~~37~~²², seventh ray $2\frac{2}{5}$; caudal
little emarginate behind, $1\frac{1}{3}$ in
total head; least depth of
caudal peduncle $4\frac{1}{4}$; pectoral
 $1\frac{2}{5}$, rays I, 14; ventral rays
I, 5, fin $2\frac{1}{2}$ in total head.

Very light or pale brown
generally, glossed with silvery
white. Iris white. Dorsal
and anal blackish, rays paler.
Caudal and paired fins all pale
or whitish.

752

Gulf Stream, off South Carolina.

E. S. H. M., no. 37861. N. Lat. $28^{\circ} 40'$
W. Long. $78^{\circ} 46'$. Albatross Collection.
Length 58 mm. Type of Centropholis
goddei.

~~*Alpenoides belague.*~~

53176 and 53177 A.N.S.P. Bombay, India.

Prof. F. Hallberg.¹⁹²⁴ Length 154 to 165 mm.

52781 to 52786 A.N.S.P. Orion, Luzon.

May 11, 1923. Rev. Joseph Clemens. Purchased.
Length 105 to 140 mm.

52787 A.N.S.P. Orion. May 9, 1923.

Rev. Joseph Clemens. Purchased. Length 141 mm.

52788 and 52789 A.N.S.P. Orani, Luzon.^{May 11, 1923.}

Rev. Joseph Clemens. Purchased. Length 122 to 127 mm.

52790 to 52795 A.N.S.P. Santa Maria,
Luzon. January 26, 1923. Rev. Joseph Clemens.
Purchased. Length 9 $\frac{1}{2}$ to 143 mm.

52796 and 52797 A.N.S.P. Santa Maria.

January 28, 1923. Rev. Joseph Clemens. Purchased.
Length 107 or 108 mm.

53000 A.N.S.P. Delagoa Bay, Portuguese
East Africa. July 1923. H. W. Bell Marley.
Length 120 mm. This *Alpenoides vittatus*.

Pterycombus petersi (Hilgendorf)

Centropholis petersi Hilgendorf,
 Sitz. Ber. Naturf. Freunde Berlin,
 p. 1, 1878 (type locality, Japanese
 seas). — Jordan, Tanaka, Snyder,
 Journ. College Sci. Tokyo, vol. 33,
 art. 1, p. 133, 1913 (reference).

Eye moderately large. Mouth cleft
 subvertical. No teeth on palate. Branchiostegals
 scales 49 in lateral series. D. 50,
 fourteenth to sixteenth rays long;
 A. 40, fourth ray long.

(Hilgendorf.)

A doubtful species, very
 imperfectly described with the
 dorsal origin said to be behind the
 eye.

Genus Mionorus Krefft.

Mionorus Krefft, Proc. Zool. Soc. London, 1867, p. 942. Type Mionorus lunatus Krefft. monotypic.

Zoogon Jordan, Copeia, no. 473 May 24, 1917, p. 46. Type Zoogon griffisi Günther. Orthotypic.

Eye less than snout, equals interorbital. Mouth cleft oblique. Teeth all villiform, without canines, on vomer and palatines, tongue smooth. Preopercle ridge and edge entire. Opercle with spine. Branchiostegals 7. Scales moderate, 30 in lateral line. Two dorsals, first with 6 spines, second with spine and 9 rays. Anal with 2 spines and 8 or 9 rays. Caudal truncate.

754

Pterycombus fulcatus Barnard

Pterycombus fulcatus Barnard,
Ann. South African Mus., vol. 21,
pt. 4, p. 599, pl. 25, fig. 1, Oct. 1927
(type locality, Cape Town, exact
locality lost, but very probably
cast ashore in Table Bay). ♂

4523. Manila market. December 12,
1907. Length 113 mm. Body silvery,
with lines of zig-zag stripes.
First dorsal white, with black spot.
Second dorsal with several irregular
lines of spots. Caudal dusky posteriorly.
Anal plain pale yellow. Pectoral
dirty white. Ventral yellowish.

1726 [D. 5-208]. Taratara Island,
S. 53° W., 1.8 miles ($11^{\circ} 45' 25''$ N., $144^{\circ} 18'$
 $05''$ E.), off western Samar. In 20
fathoms. April 14, 1908. Length 115 mm.

Depth $2\frac{1}{2}$; head $4\frac{1}{4}$. Snout 5 in head from snout tip; eye 3, greater than snout, slightly greater than interorbital; maxillary reaches $\frac{1}{2}$ in eye, expansion 2 in eye, length 2 in head from snout tip; interorbital slopes up steeply behind. Gill rakers 1 + 7, inner edges with spinules.

Scales 48 in median lateral series to caudal base; 20 transversely behind pectoral, most scales with hooked spine directed backward, except on hind part of body and caudal peduncle, change of direction occurring at level of 43rd dorsal spine; 4 rows of spiniferous scales each side of caudal peduncle. Head, except snout, interorbital, supraorbital, front part of preorbital, lower jaw and angle

of preopercle scaly. Vertical fins scaleless.

D. XIX, begins above hind edge of eye, front spines very short gradually increase in length to eighth which equals eye, twelfth to fourteenth $\frac{2}{3}$ of body; A. XI, begins below scaly pectoral base, first spine very short, graduated to third, fifth and sixth abruptly longer or equal longest dorsal spines; caudal long as head, well forked, least depth of caudal peduncle 4; pectoral 1, rays 20, upper 2 rays spine like, stouter than others; ventral inserted little before dorsal origin, slightly longer than eye. Uniform bright silvery, fins pale horn color, tips and margins of dorsal and anal brownish. Iris silvery. Length 300 mm.

(Batomara.)

South Africa.

757

Pterycumbus bedanoisi (Belloe)

Centropholis bedanoisi Belloe, no. 5,
Bull. Mus. Hist. Nat. Paris, vol. 32,¹
fig. (poor)
p. 27, 1926 (type locality, "bord du banc
de la Grand Soleil, lat. $49^{\circ}53'N.$, in 360 meters;
prayes du cap Bofador").
Tarnard, Kew. South African
Mus., vol. 26, pt. 2, p. 600, Det. 1927
(note).

92

Mionorus mydrus Jordan and Seale.

Mionorus mydrus Jordan and Seale, Proc.

A. N. Nat. Mus., vol. 28, 1905, p. 778, fig. 4.

Negros; Bull. Bur. Fisher., vol. 26, 1906
(1907), p. 17 (Manila).

Depth $2\frac{1}{2}$; head $2\frac{1}{4}$, width $2\frac{1}{2}$.
Snout $5\frac{2}{3}$ in head from snout tip; eye
 $2\frac{2}{3}$ in head, greater than snout,
subequal with interorbital; maxillary
reaches opposite eye center, expansion
 $\frac{3}{5}$ in eye, length $\frac{4}{5}$ in head from
snout tip; teeth minute, uniform,
in narrow bands in jaws, in vomer
and palatines; interorbital $2\frac{1}{3}$, little
convex; preopercle edge and ridge
entire. Gill rakers $4\frac{2}{3} + 12$,
lanceolate, longer than gill filaments
or about $\frac{2}{3}$ of eye.

Scales 24 in lateral line to
caudal base and 2 more on latter,

758

Depth 2; head $3\frac{1}{2}$. Eye 5 in head, greater than snout; maxillary reaches $\frac{1}{3}$ in eye, expansion 2 in eye, length $1\frac{1}{2}$ in head; teeth cardiform, fine, pointed, recurved, biserial, none on palate; interorbital moderately high.

Scales 51 in lateral line, 17 or 18 transversely.

D. I, I, begins behind eye, depressible in 2 rows of basal scales; A. XII, like dorsal, origin behind pectoral base; pectoral rays 20, slightly longer than head; ventral rays I, 5, equals eye; caudal emarginate.

Silvery gray. Vertical fins black. Pectoral gray yellow. Length not given. (Bellot.)

Eastern Atlantic.

759

Pterycombus brama Fries

Pterycombus brama Fries, Kon.
Svensk. Vet. Akad. Handl.
Stockholm, 1837, p. 15, pl. 2
(type locality, Ishafvet). —

Lützen, Kon. Danske Vidensk.

Helsk. Skrift. Kjöbenhavn, ser. 5,
vol. 12, no. 6, p. 501, pl. 4, fig. 4, 1880
(young),
between Africa and South America;
(Finnmarken; Bergen). — Smith,
Scandinavia Fishes, vol. 1, p. 73, fig.
21, 1892 (Norway records). —

Jordan, Ann. Carnegie Mus., vol.
12, nos. 2-4, p. 331, pl. 57, upper
figure, Dec. 15, 1919 (copied).

~~1³/₅ to 1⁴/₅ in eye, length 2²/₅ to 2¹/₂ in head; barbels reach opposite or slightly beyond preopercle edge, length 1¹/₂ to 1³/₅ in head; teeth finely villiform, in narrow bands in jaws of 3 or 4 irregular series; very narrow band of fine villiform teeth on each palatine, sometimes few on vomer, though often obsolete or absent in young; interorbital 3¹/₄ to 4, broadly convex; preopercle edge entire. Gill rakers 5 + 14, lanceolate, 1⁷/₅ in gill filaments, which 1¹/₄ in eye; 2 upper and 6 lower rudimentary.~~

~~Scales 32 or 33 in lateral line to caudal base and 2 or 3 more on latter; 3 above, 6 below, 14 to 16 predorsal forward to snout tip; 3 rows on cheek. Scales of lateral line arborescent. Soft dorsal and anal scaly on anterior~~

760

Depth $1\frac{7}{8}$; head $3\frac{1}{4}$. Snout $4\frac{1}{6}$ in head from upper jaw tip; orbit $2\frac{2}{5}$; maxillary reaches $\frac{1}{2}$ in eye, length $1\frac{3}{4}$ in head from snout tip; teeth fine, pointed, curve inward in partly regular and irregular rows, and lower biserial with inner row little larger, especially forward; palate and tongue without teeth; interorbital convexly elevated.

Scales 49 to 51 in median lateral series, 20 transversely (without basal fin sheaths). Head scaly, except snout, premaxillary, opercle flange and mandible. Caudal mostly scaled.

D. IX, XLI to XLV, origin above hind orbital edge, further back in young, longest rays $\frac{3}{5}$ body depth; A. III, XXXVII to XL, longest rays $\frac{3}{4}$ body depth; caudal deeply

761

forked, long as head without mandible; least depth of caudal peduncle $\frac{4}{5}$ in head; pectoral 1; ventral $3\frac{3}{4}$, inserted before pectoral origin.

Silvery white, somewhat darker on back, with dorsal, anal and ventral blackish and pectoral light yellow. Length 384 mm.

(Smith.)

North Atlantic.